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8598/83/1

DDI- ~~16008~~ [redacted]

32

16 December 1983

MEMORANDUM FOR: Deputy Director for Intelligence

FROM : [redacted] 25X1
Director of Soviet Analysis

SUBJECT : NSC Request for Information on Strategic Oil and Gas Equipment (28 November 1983)

1. Attached is the Soviet Economy Division's package of material responsive to Mr. deGraffenreid's request on behalf of Roger Robinson. Maurice Ernst spoke with Roger to clarify the request. Since the NSC apparently has decided that the specified categories of oil and gas equipment will be formally proposed to COCOM for multilateral foreign policy (rather than unilateral national security) controls, we have not addressed the questions of non-US availability or the date the items were last under national security controls, if ever. These questions were omitted at Maurice's suggestion. [redacted] 25X1

2. The package includes a memorandum to Mr. deGraffenreid for your signature, a brief overview of Soviet requirements for Western oil and gas equipment (prepared at Maurice's request), the matrix of hardware items, and an update on the Barents Sea Project. The package has been coordinated with OSWR/TTAC, EURA, and OGI. [redacted] 25X1

[redacted] 25X1

Attachments:
as stated

SOVM83-10216

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Central Intelligence Agency

DDI- 8598/83/2

Washington, D.C. 20505

15 DEC 1983

MEMORANDUM FOR: Kenneth E. deGraffenreid
Director of Intelligence Programs
National Security Council

SUBJECT : Information on Strategic Oil and Gas Equipment [redacted] 25X1

REFERENCE : Your Memorandum of 28 November 1983

1. Pursuant to your request we enclose papers addressing three issues relevant to US strategic oil and gas policy. The first provides a brief perspective on the Soviet need for Western oil and gas equipment. The second is a matrix describing the items of equipment proposed for multilateral COCOM controls. Finally, we include an update on the Barents Sea Project and related equipment requirements. [redacted] 25X1

[redacted] 25X1

2. In preparing the matrix you requested, we have made some modifications in an attempt to make it most useful. As you know, the list of 17 items originally proposed for control in April 1983 has been refined and updated and now covers 21 items not now under controls. We have limited the matrix to the 11 specific items of hardware included in the proposed list. The remaining items deal with technology and data on the design, production, and use of these 11 hardware items. Although items such as oil and gas equipment were multilaterally controlled in the early years of COCOM, the organization's strategic criteria are now interpreted to apply only to items with significant and direct applications in military systems. The items now being proposed are deemed to meet the COCOM strategic criteria. The matrix is laid out as follows: 1) the name of the item, 2) likely use in the Soviet oil and gas industries, 3) non-COCOM availability and 4) potential military signficance. [redacted] 25X1

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3. If you have any questions, please call [redacted] our Office of Soviet Analysis [redacted] 25X1

Robert M. Gates
Deputy Director for Intelligence

Attachments:

(1) Perspective on Soviet Need for Western Oil and Gas Equipment
(2) Strategic Oil and Gas Equipment Proposed for COCOM Controls
(3) USSR: Barents Sea Project for Oil and Gas Exploration

SUBJECT: NSC Request for Information on Strategic Oil and Gas Equipment

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ATTACHMENT 1

Perspective on Soviet Need for Western Oil and Gas Equipment

Although the Soviet oil and gas industries are largely self-sufficient, the USSR will have a continuing need for specific items of Western oil and gas equipment to find and exploit deeper and more complex deposits. In spite of equipment and technology that generally are inferior to those available in the West, the Soviets lead the world in oil production and should overtake the United States as the world's largest gas producer this year. These achievements are the product of rapid development during the past two decades of a large number of relatively shallow oil and gas discoveries in the Volga-Urals and Tyumen' regions of the USSR. As the USSR seeks to discover and develop new oil and gas deposits, it will encounter deeper and more complex geologic conditions--often in highly corrosive environments under high pressure and temperature. These conditions will pose a substantial challenge because the Soviet economic system has not been able to provide either high quality oil and gas drilling and producing equipment or advanced state-of-the-art production techniques and systems. [redacted] 25X1

The Soviets have, in the past, compensated for equipment shortcomings with imports, but they have done so only selectively to cover spot shortages of domestically manufactured equipment or for particularly difficult or special applications. In 1972-81, the USSR bought about $5 billion worth of Western oil and gas

equipment--an amount we estimate to have been roughly one-tenth of its total oil and gas equipment requirements. These imports often had an impact far out of proportion to their cost, however, because they were used on the Soviets' largest and most critical projects. 25X1

Moscow intends to continue purchasing Western oil and gas technology and equipment for specialized needs and is looking to France, West Germany, Italy, Canada, Japan, the Scandinavian countries, and (to a diminishing extent) the United States--which it believes is an unreliable supplier--for the items that will be necessary. We believe future purchases will cluster into ten broad categories:

- Oil and gas exploration equipment.
- Deep-well drilling equipment and technology.
- Fluid-lift and oil-treatment equipment.
- Offshore drilling and production platforms and related systems.
- Computers and automated control technology and equipment.
- Specialized corrosion-resistant drilling and production equipment for high-pressure, high-temperature service.
- Enhanced oil recovery technology and equipment.
- Secondary oil refining equipment.
- Gas-processing equipment.
- Gas pipeline equipment. 25X1

In addition, the Soviets are attempting to alleviate equipment problems with an across-the-board effort to enhance

domestic manufacturing capabilities. By almost any measure, the Soviets have improved the quality of domestic oil and gas technology and equipment over the past few years, and we expect to see some improvements over the rest of this decade. Domestic industry will continue to provide the bulk of Soviet oil and gas equipment requirements for shallow deposits but the acquisition of more advanced Western equipment will be critical to finding and developing deeper, less accessible onshore and offshore reserves in the 1980s and 1990s.

The effect of foreign purchases and domestic technology improvements on oil and gas output will ultimately depend on the ability of the Soviets to assimilate and apply them on a timely basis. The track record, however, as elsewhere in Soviet civilian industries, has been poor. Soviet research institutes and key industrial ministries have acquired state-of-the-art knowledge and have closely studied and tried to copy Western techniques and equipment. But the timely application of this knowledge and equipment in large-scale field projects has been difficult, primarily because of systemic constraints--a dysfunctional incentive and reward system and a reluctance on the part of managers to take necessary risks. The Soviets recognize these problems and have made some preliminary attempts at solving them, but we do not expect the kind of fundamental changes that would allow the implementation of new and improved technologies

on a timely basis or on a scale that would dramatically raise efficiency and productivity in the oil and gas industries. [redacted] 25X1

Nevertheless, the Soviets' need for Western oil and gas equipment and technology is not so great that it would impel them to take political or military risks, such as moves against Iran or the Persian Gulf area. For at least the remainder of the 1980s, the bulk of Soviet oil and gas production will continue to come from large shallow deposits of petroleum that pose few technical obstacles to exploitation. An increasing share of output will, however, originate from deeper deposits in more complex geologic environments, where--in the absence of unexpected progress in Soviet manufacturing capabilities--Western equipment will be needed. The denial of Western equipment would require the Soviets to allocate more investment to industries manufacturing oil and gas equipment and would make energy production somewhat more difficult and costly. It could also produce ripple effects in the economy, but these almost surely would be minor and, in any event, difficult to quantify. The effort that was rallied to complete the laying of the gas export pipeline ahead of schedule is only one indication of Soviet willingness to devote the necessary resources to what the USSR considers to be high-priority projects. Moreover, the capability of not only Soviet industry but other potential suppliers of oil and gas equipment outside of COCOM is improving rapidly. [redacted] 25X1

[redacted] 25X1

ATTACHMENT 2

Strategic Oil and Gas Equipment Proposed for COCOM Controls

Item	Application	Non-COCOM Availability
1. Deep, submersible, high-pressure pumps with a capacity of at least 135 tons per day of fluid at depths greater than 600 meters (IL-1131)	Secondary oil recovery (to handle increasing volumes of water produced with oil)	None; could be developed in about two years
2. Geophysical/seismic survey vessels including geophysical hardware and software systems (IL-1416) (including positioning and navigation systems)	Offshore oil and gas exploration	None for onboard high-technology equipment
3. Navigation, direction-finding, radar, and airborne communication equipment (IL-1501) (including satellite navigation equipment)	Offshore oil and gas exploration	None
4. Acoustic and/or ultrasonic systems or equipment specially designed for locating underwater or subterranean objects or features (IL-1510) (including offshore positioning equipment)	Oil and gas exploration (onshore and offshore)	None for offshore positioning equipment; none for side-scan sonar equipment; Australia and Sweden for sub-bottom profiling equipment
5. Gravity meters and components thereof with an accuracy of 0.1 milligal (IL-1595)	Oil and gas exploration (onshore and offshore)	Sweden
6. Corrosion-resistant oil and gas producing equipment capable of operating in corrosive environments containing more than 10 parts per million hydrogen sulfide and carbon dioxide (IL-1100 NI)	Exploitation of sour gas/oil deposits	Argentina, Austria, Brazil, Mexico, Sweden, and Venezuela have limited capability to supply some of this equipment which is based on COCOM Technology.

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Item	Application	Non-COCOM Availability
7. High-pressure/high temperature oil and gas producing equipment capable of operating at pressures exceeding 350 atmospheres and at temperatures above 93°C. (IL 1100 NI)	Exploitation of deep oil and gas deposits	Argentina, Austria, Brazil, Mexico, Sweden, and Venezuela have limited capability to supply some of this equipment which is based on COCOM Technology
8. Deep-well drilling rigs and systems capable of operating below 3,000-meter depths (IL-1500 NI)	Exploitation of deep oil and gas deposits	None for complete systems; Austria, Brazil, Finland, Mexico, Singapore, Sweden and Switzerland have limited capability for some equipment items based on COCOM technology; USSR and Romania make systems of inferior quality
9. Magneto-telluric systems (IL-1500 NI)	Oil and gas exploration (onshore and offshore)	None at present in West; USSR (low quality)
10. Well-logging equipment and related computer hardware and software (IL-1500 NI)	Evaluation of oil and gas discoveries, especially deep deposits	None for complete systems; Austria, Hungary, USSR, Romania, Sweden, and Taiwan have limited capability to produce some items of inferior quality.
11. Mud-logging equipment and technology and related computer hardware and software (IL-1500 NI)	Deep drilling operations under high-pressure, high temperature, and corrosive conditions.	Very limited in terms of computer hardware and software

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ATTACHMENT 3

USSR: Barents Sea Project for Oil and Gas Exploration

USSR-Boconor Agreement

During the past two summers, two Soviet drillships have conducted exploratory drilling in the Barents Sea. The results of this drilling effort are unknown thus far. However, the USSR recently signed an agreement with a consortium of seven large Norwegian firms, Boconor (Barents offshore consortium of Norway), to provide a general work plan for exploration and development of oil and gas deposits in the Barents Sea. The firms are Norwegian Petroleum Consultants (NPC), the Aker Group, Veritas, GECO, Kongsberg Vaapenfabrikk, the Kvaerner Group, and Norwegian Contractors. This undertaking has been referred to as the Barents Sea Project (BSP). It represents a preliminary step in providing guidelines for the much more difficult future task of systematically exploring and developing Barents Sea oil and gas. The group will provide a report detailing technical assistance and management services required for the exploration of an area covering about one-third of the central Barents Sea area. [redacted] 25X1

The Boconor study--which cost the Soviets $135,000--has been completed. The Norwegian firms hope that the report will be a vehicle for possible future sales of goods and services to the USSR, particularly geophysical services and concrete gravity bases for offshore rigs. The Norwegian Government has assured the United States both publicly and privately that it will meet its OECD (credit) and COCOM (export control) commitments. [redacted] 25X1

[redacted] 25X1

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Exploration (geophysical and seismic surveying) activity is expected to begin in the shallower near-shore waters of less than 200-foot depth. Thus far, the Soviets are reported to have mapped about 15-20 structures including several large features which cover a 10 square kilometer area. They are rumored to have discovered gas southeast of the previous location of the drillship Valentin D. Shashin (see map). [redacted] 25X1

The most critical task of Boconor will be to develop plans and methods for year-round offshore drilling through Arctic pack ice, using seafloor wellheads and reentry technology. Norwegian firms have little or no actual experience in drilling through pack ice. All the expertise in the relevant techniques has been developed by US and Canadian firms in Alaska, the Mackenzie River Delta, and the Beaufort Sea. [redacted] 25X1

Technology

Geophysical surveying is an essential first step in the exploration-development cycle of any new oil or gas province. Offshore surveying is usually carried out by vessels equipped with sophisticated electronic geophysical hardware and software. The equipment package includes computers, hydrocarbon-seep detectors, gravity meters, magnetometers, seismographs, geophones and streamers, and satellite navigation and offshore positioning equipment. This equipment is capable of providing simultaneous multi-survey mapping on a real-time basis. If any promising geologic structures are mapped, year-round drilling is contemplated through the Arctic pack ice and the water below. Exploratory drilling operations will be conducted from either

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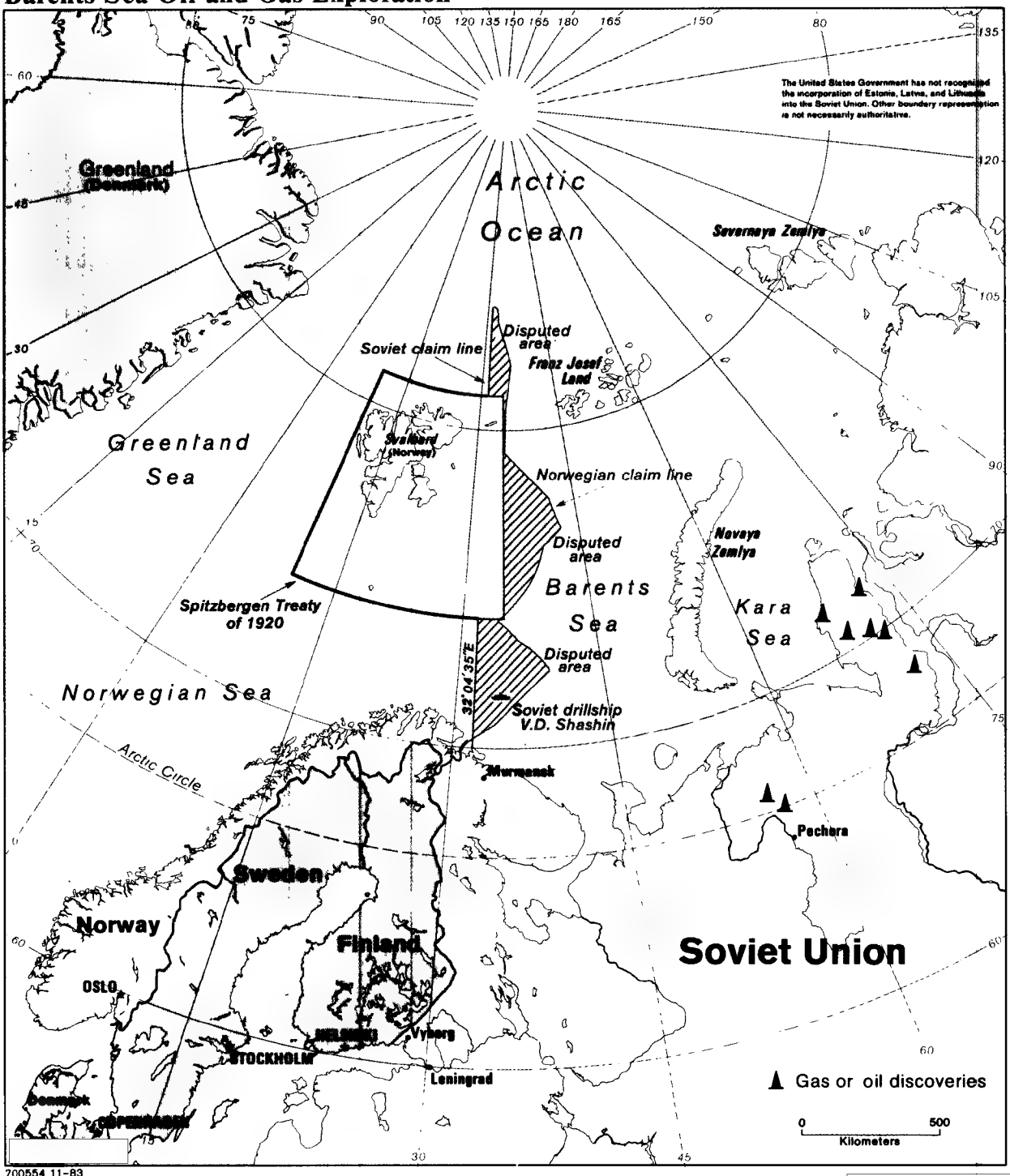
Barents Sea Oil and Gas Exploration



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drillships or semi-submersible platforms. Each drilling rig will be enclosed and heated, a feature which will be incorporated on fixed production platforms as well. Production platforms will likely use advanced monobuoy (floating) or monopod (fixed) designs with ice-breaking features. 25X1

The Soviets are building two semi-submersible rigs at the Baltic port of Vyborg. They are considering North Sea-type concrete gravity-base platforms and steel monopod platforms like those used in Alaska's Cook Inlet for the development of any commercial oil and gas deposits found. 25X1

All drilling platforms would require elaborate electronic instrumentation, including computers. Dynamic positioning systems and controls are essential for drilling from floating platforms, and reentry guidance systems are required for all deep-water drilling with seafloor wellheads. The latter systems include telescoping risers, radars, sonars, video-display equipment, and controls. Positioning systems contain computer-controlled thrusters or anchoring systems to keep the rig on location over the seafloor wellbore. 25X1

The development plan likely will incorporate 200 seafloor-caisson completion systems. Each oil or gas well is to be completed inside a large countersunk silo or pipe, with the Christmas tree protruding only 10 feet above the seafloor--as opposed to 50 feet for conventional installations. 25X1

Recent Soviet Drilling Activity

Last May the Valentin D. Shashin[1] moved out of Murmansk and began to drill an exploratory offshore well in the Barents Sea about 250 kilometers northeast of the Norwegian coast. This location is roughly 1.5 nautical miles west of Norway's claimed median-line boundary. The drillship has now moved from this area, and there has been no information on the drilling results to date. Many geologists believe that this area possesses considerable oil and gas potential. Location of the area to be explored under the Barents Sea Project agreement is well to the southeast of the Shashin's previous drilling location. 25X1

Offshore Boundary Dispute

The Soviet positioning of the Valentin D. Shashin and drilling of a well within the accepted margin of error astride Norway's claimed median-line boundary highlights a long-simmering boundary dispute between Norway and the USSR. At the base of the dispute are conflicting methods used by the two countries to define the maritime boundary in the Barents Sea. At stake is some 150,000 square kilometers (km^2) of the Barents Sea continental shelf. Negotiations to resolve this dispute began in the mid-1970s but have been in abeyance since 1981. New talks are taking place in December 1983. 25X1

The Soviet position is based on a 1926 decree in which the USSR claimed all land and islands in an Arctic sector enclosed by

[1] In 1982 this drilling ship and its two sister ships, the Muravlenko and Mirchink, were delivered to the USSR by Rauma Repola of Finland. All three ships are outfitted with Western instrumentation (including Norwegian dynamic positioning equipment) and exploratory drilling tools. 25X1

the meridian lines extending due north to the pole from the USSR's territorial extremities, along 32°04'35"E in the west. The Soviets advocate use of the same meridian to separate USSR-Norwegian economic interests in the Barents Sea. Norway maintains that the continental-shelf boundary should be used to determine an equidistant line between its mainland and island territories and those of the USSR. According to the Norwegian representative to the 1981 talks, Norway would be willing to consider some compromise on the disputed lines; the Soviets, however, have shown no interest in compromising thus far. 25X1

The status of Svalbard, a Norwegian archipelago in the Arctic Ocean, may compound the Soviet-Norwegian dispute. Under the 1920 Spitzbergen Treaty, Norway was given sovereignty over the islands enclosed by the treaty lines; 40 other nations were given rights to exploit resources on the islands. The treaty did not cover Svalbard's continental shelf resources, which Norway claims exclusively. The Soviets claim that, as a signatory to the 1920 treaty, they also have rights to mineral exploitation on Svalbard's continental shelf. 25X1

Soviet Motives

Conclusion of an agreement with the Norwegian consortium on the Barents Sea Project was largely politically motivated, due to the boundary dispute. The BSP helps to create a more harmonious atmosphere between the two nations with regard to negotiation of the offshore boundary. Economically, the Soviets need to locate large new oil discoveries in order to supply long-term energy needs. No large onshore oil discoveries have been reported since

the West Siberian fields were found in the 1960s. Offshore, the search has only begun.

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The Soviets currently have little or no offshore technical capability of their own, and the BSP opens a "door"--albeit a small one--to the West's providing access to state-of-the-art equipment and technology. Because the Soviets continue to fear US trade controls, the Norwegian "door" can be expected to provide the initial technical support and guidance required for planning future Barents Sea petroleum operations. It also provides a low-cost means of determining which competing Western equipment suppliers and engineering construction firms will cooperate with the USSR on the BSP.

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In the broader context of a full-scale exploration and development program, the monetary value of the current NPC contract is small. The eventual cost of developing a giant Prudhoe Bay-size discovery could easily amount to $25 billion, depending on location. The Norwegian consortium stands to earn surcharges on equipment and services procured for the Soviets, plus direct payments for other technical and management services rendered in the exploration stage. In the event of a discovery

of major or giant proportions, the Soviets realize that only major Western oil companies possess both the financial and technical resources to undertake such development. Unfortunately, from the Soviet viewpoint, many of these firms already have a full plate of such projects with their underdeveloped Alaskan, Canadian, North Sea, and China offshore leaseholdings. British Petroleum, for example, recently demurred when approached by the Soviets, claiming the press of other business. [redacted] 25X1

Long-Term Prospects

A gas pocket rumored to have been discovered at approximately 72°N., 40°E., could be the top of an oil field or a gas discovery. If the find is gas, there will probably be much less interest than if it is oil. The Soviets have vast undeveloped reserves of gas onshore and--as demonstrated by the prospective costs of developing the Tromso gas discoveries in the Norwegian Sea--offshore production entails extremely high capital outlays. Moreover, the Soviets clearly view the development of any Barents Sea hydrocarbons as long-term. Any oil or gas found there is not likely to be available--even with significant Western assistance--until well into the 1990s. The impact on the Soviet economy of non-development of such resources cannot be addressed at this time because we do not know the true potential of the area offshore. The pace of development will depend on conditions encountered in the future at Soviet onshore--principally West Siberian--oil deposits. [redacted] 25X1

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